E. A. WISE.

IGNITION AND LIGHTING SYSTEM FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED APR. 21, 1920.

1,388,540. Patented Aug. 23, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

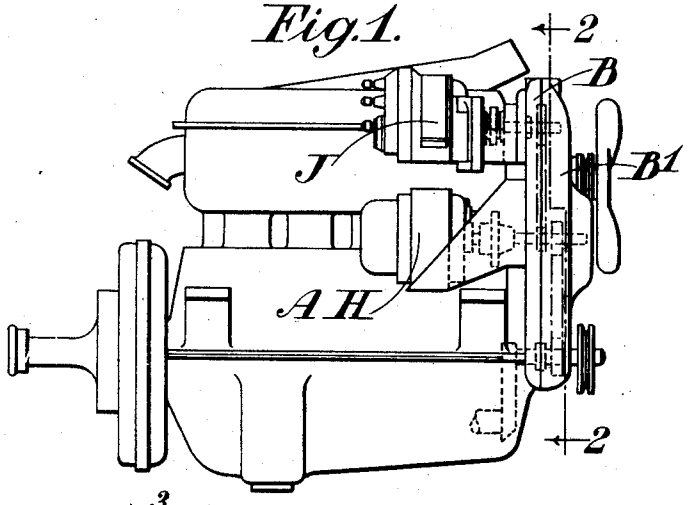


Fig. 2.

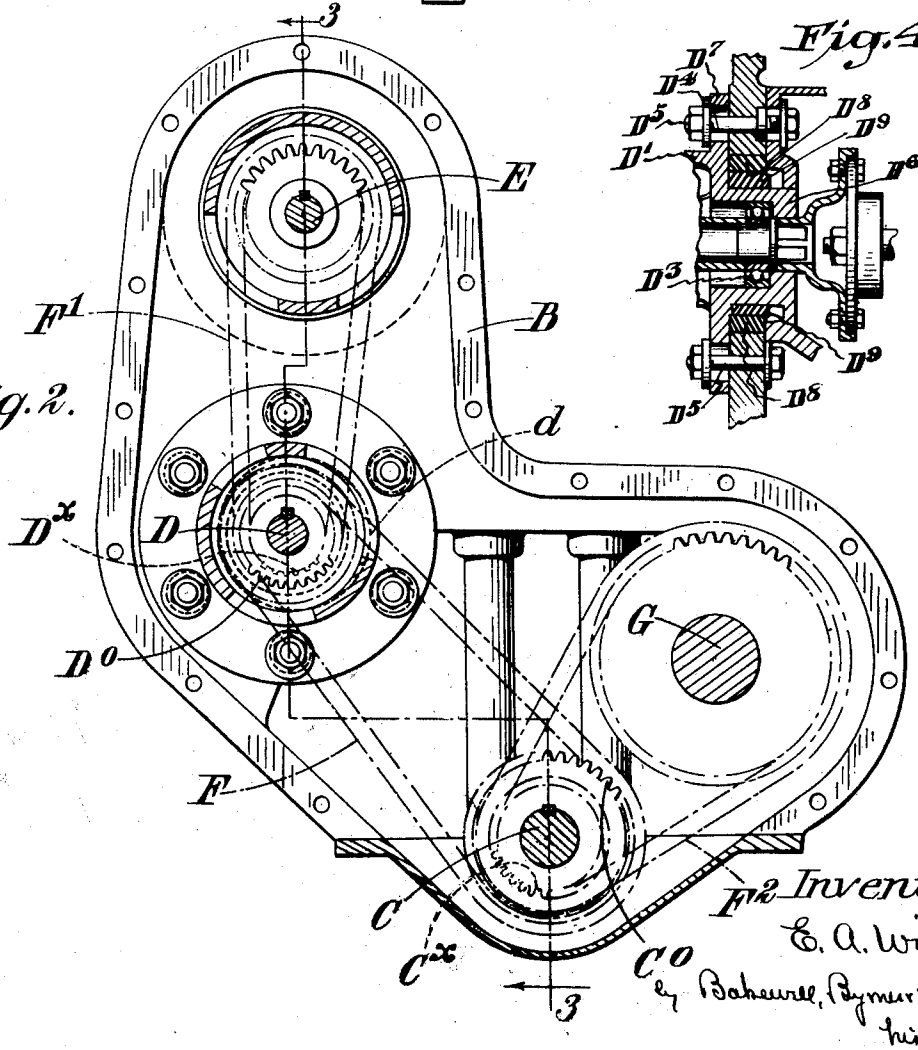


Fig. 4.

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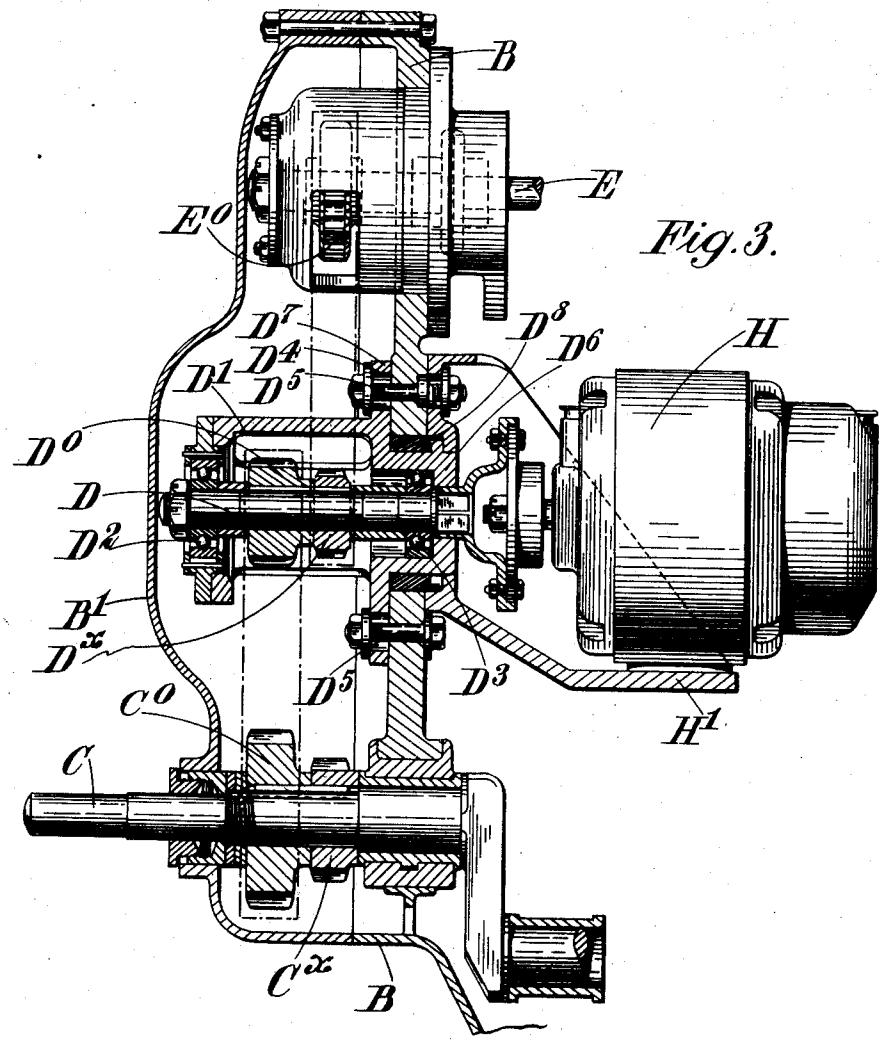


Fig. 3.

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UNITED STATES PATENT OFFICE.

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IGNITION AND LIGHTING SYSTEM FOR INTERNAL-COMBUSTION ENGINES.

1,388,540. Specification of Letters Patent. Patented Aug. 23, 1921.

Application filed April 21, 1920. Serial No. 375,585.

To all whom it may concern:

Be it known that I, ERNEST ALFRED WISE, a subject of the King of England, residing at Caversham, Reading, in England, have invented certain new and useful Improvements in Ignition and Lighting Systems for Internal-Combustion Engines, of which the following is a specification.

This invention relates to ignition and lighting systems for internal-combustion engines, and has for its object to so arrange the engine-shaft, motor-shaft (for lighting purposes), and the magneto-shaft, that the chain drive connecting these shafts may be adjusted by means of a single eccentric. The invention also has relation to an improved means for mounting the magneto and dynamo so that they are rigid with the engine-casing.

Various arrangements have been made for adjusting chain-drive in such systems, but according to this invention there is combined with the driving-shaft, dynamo-shaft, and magneto-shaft disposed parallel to each other but not all in the same plane, and chain-gearing connecting them together all on the same side of the engine, a bracket secured to the engine in such manner that it can be bodily adjusted parallel to itself in any direction and which bracket provides bearings on both sides of the chain-drive for that one of the three shafts previously mentioned which is intermediate of the other two, so that by adjustment of this bracket, its shaft can always be brought to a position to properly tighten the chains extending to the other two shafts.

Preferably the adjustable bracket in addition to its securing means, engages the engine through the medium of a cam-ring, so that when it is loosened it can be adjusted to the desired position by the eccentric.

The invention further relates to other details all of which are hereinafter fully described with reference to the drawings and whereof the novel features are pointed out in the claims.

In the accompanying drawings which illustrate one method of carrying out this invention:—

Figure 1 is a side elevation of an engine showing the chain-gearing casing, the dynamo and magneto mounted thereon;

Fig. 2 shows the chain-gearing and its casing on a larger scale and in section on the line 2—2 of Fig. 1 but with the cover-plate removed, and

Fig. 3 is a section at right-angles to that of Fig. 2 on the bent line 3—3 of Fig. 2, and

Fig. 4 is a detail sectional view corresponding to part of Fig. 3 showing a modification.

The same letters indicate the same parts throughout the drawings.

The engine A has rigidly secured on it at one end part of a casing B within which the ends of the engine-shaft C, dynamo-shaft D, and magneto-shaft E are housed. These shafts carry sprocket-wheels C^0, $C^\times$ D^0, $D^\times$, E^0 and are interconnected by chains F, F^1. The engine-shaft is also interconnected by a chain F^2 to the cam-shaft G. It will be seen that all the sprocket-wheels for the shafts D and E, together with their chains are situated at one and the same side of the motor, and that although the shafts are parallel to each other they are not in the same plane, so that it follows that the chains F and F^1 can always be properly adjusted by movement of the shaft D. To enable this movement to be made, the shaft D is carried in a bracket D^1 which provides ball-bearings D^2 and D^3 for the shaft on opposite sides of the sprocket-wheels mounted on that shaft. The bracket is provided with side-openings to permit the passage of the chains F and F^1 and has a flange D^7 whereby it is secured to the casing B which is rigid with the engine. The holes D^4 in the flange D^7 to receive the fastening-bolts D^5 are considerably larger than the bolts so that the bracket can be adjusted bodily parallel to itself in any direction on the flat face of the casing B. To control this adjustment, the bracket is provided with a cylindrical stem D^6 which is surrounded by a cam-ring D^8 mounted to move angularly in a hole in the casing B. Any convenient means may be provided for operating this cam-ring, and thus when the bolts D^5 are slackened, the ring can be turned to move the bracket D^1 and thus the shaft D to such position that the chains F, F^1 are properly adjusted, and when this position has been found, the bolts D^5 are tightened up and thus the shaft is held in the adjusted position. The whole gear is covered in by an outer plate B^1, shown in Figs. 1 and 3.

It will be appreciated that to avoid a com-

plicated connection between the shaft D and the dynamo H which it drives, the dynamo should be directly coupled to the shaft D and therefore the dynamo must move with any adjustment of the shaft. By arranging the casing B to project out from one side of the motor A, it provides a support upon which the dynamo can be carried. A bracket H^1 is mounted on the opposite side of the casing B to that occupied by the bracket D^1 but is secured in place by the same bolts and is centered on the stem D^6 of the bracket D^1, so that as the bracket D^1 is moved, the bracket H^1 will be correspondingly adjusted. This bracket H^1 is also provided with large holes in the parts engaged by the bolts D^5 so that when the bolts are loosened they do not interfere with its adjustment.

If desired, a second cam ring D^9 may be mounted within the cam ring D^8 as shown in Fig. 4, and these two cam rings may be independently adjustable. It will be appreciated that where two cam-rings are thus employed the shaft D can be moved into various positions which are not possible with the one cam-ring only. The cam-rings may of course be of any degree of eccentricity desired.

The magneto J and the dynamo H are both housed on the same side of the engine, as shown in Fig. 1, and lie behind the projecting portion of the casing B. The magneto is rigidly secured to the engine A, and the same is true of the dynamo through the medium of the parts H^1 and B. Both of these elements are on the non-valve-tappet side of the engine, which in fact makes it possible to mount them rigidly on the engine, and thus vibration such as results when one or more of these elements is carried on a part not rigidly connected with the engine is avoided.

Although this rigid securing of these parts to the engine and the setting of the one element, namely the magnet, above the other, that is, the dynamo, is primarily intended to allow for the adjustment of the chains F, F^1 as already explained, yet it will be appreciated that even apart from the question of chain-adjustment the construction has the advantage of rigidity referred to.

What I claim as my invention and desire to secure by Letters Patent is:—

1. The combination with an internal-combustion engine-casing, a driving-shaft extending through one wall thereof, a dynamo-shaft, a magneto-shaft, all of which shafts are disposed parallel to each other but not all in the same plane, and whereof one is situated intermediate between the driving-shaft and the other shaft, and chain-gearing connecting all said shafts together on the same side of said wall, of a bearing-bracket adjustably mounted on said casing so that it can be bodily adjusted parallel to itself in any direction, which bracket has two bearings for the intermediate shaft situated one on either side of said chain-gearing, substantially as set forth.

2. The combination, with an internal-combustion engine-casing, a driving-shaft extending through one wall thereof, a dynamo-shaft, a magneto-shaft, all of which shafts are disposed parallel to each other but not all in the same plane and whereof one is situated intermediate between the driving-shaft and the other shaft, and chain-gearing connecting all said shafts together on the same side of said wall, of a cam-ring adjustably mounted in said casing, and a bracket that is mounted in said cam-ring and has two bearings for the said intermediate shaft situated one on either side of said chain-gearing, substantially as set forth.

3. The combination, with an internal-combustion engine-casing, a driving-shaft extending through one wall thereof, a dynamo-shaft, a magneto-shaft, all of which shafts are disposed parallel to each other but one in a plane different from that containing the other two, and whereof one is situated intermediate between the driving-shaft and the other shaft, and chain-gearing connecting all said shafts together on the same side of said wall, of a cam-ring mounted in said wall to rotate about an axis parallel to the axes of said shafts, and a bearing-bracket having a stem mounted in said cam-ring, which bracket has two bearings for the said intermediate shaft situated one on either side of said chain-gearing, substantially as set forth.

4. The combination, with an internal-combustion engine-casing, a driving-shaft extending through one wall thereof, a dynamo-shaft, a magneto-shaft, all of which shafts are disposed parallel to each other but not all in the same plane, and whereof one is situated intermediate between the driving-shaft and the other shaft, and chain-gearing connecting all said shafts together on the same side of said wall, of a bearing-bracket adjustably mounted on said casing so that it can be bodily adjusted parallel to itself in any direction, which bracket has two bearings for the intermediate shaft situated one on either side of said chain-gearing, a second bracket operatively connected with and movable with said bearing-bracket, and a dynamo-electric machine mounted on said second bracket and having its armature-shaft operatively connected with the intermediate shaft.

5. The combination, with an internal-combustion engine-casing, a driving-shaft extending through one wall thereof, a dynamo-shaft, a magneto-shaft, all of which shafts are disposed parallel to each other but not

all in the same plane and whereof one is situated intermediate between the driving-shaft and the other shaft, and chain-gearing connecting all said shafts together on the same side of said wall, of a bearing-bracket adjustably mounted on said wall on the same side thereof as said chain-gearing so that it can be bodily adjusted parallel to itself in any direction, which bracket has two bearings for the intermediate shaft situated one on either side of said chain-gearing, a second bracket arranged on said wall on the side thereof opposite to that whereon the said bearing-bracket is arranged and movable with said bearing-bracket, bolts adjustably securing said brackets together and to said wall, and a dynamo electric machine mounted on said second bracket and having its shaft operatively connected with the intermediate shaft.

6. The combination, with an internal-combustion engine-casing, a driving-shaft extending through one wall thereof, a dynamo-shaft, a magneto-shaft, all of which shafts are disposed parallel to each other but not all in the same plane and whereof one is situated intermediate between the driving-shaft and the other shaft, and chain-gearing connecting all said shafts together on the same side of said wall, of a cam-ring angularly adjustable in said wall, a bearing-bracket having a stem mounted in said cam-ring, which bearing-bracket has two bearings for the intermediate shaft situated one on either side of said chain-gearing, a second bracket seated on said stem on the side of said wall opposite to that on which the bearing-bracket is situated, bolts extending through said wall and with play through holes in said brackets for securing the latter in various positions to said wall, and a dynamo-electric machine mounted on said second bracket and having its armature-shaft operatively connected with the intermediate shaft.

7. The combination, with an internal-combustion engine-casing, a driving shaft extending through one wall thereof, a dynamo-shaft, a magneto-shaft, all of which shafts are disposed parallel to each other but not all in the same plane and whereof one is situated intermediate between the driving-shaft and the other shaft, and chain-gearing connecting all said shafts together on the same side of said wall, of a cam-ring mounted to be angularly adjustable in said wall, a second cam-ring mounted within the former cam-ring and angularly movable therein independently of the former, a bearing-bracket mounted in said second cam-ring, which bracket has two bearings, for the said intermediate shaft situated one on either side of said chain-gearing, and a dynamo-electric machine mounted on said second bracket and having its armature-shaft operatively connected with the intermediate shaft, substantially as set forth.

In testimony whereof I affix my signature.

ERNEST ALFRED WISE.